**Objectives**

Upon completing this activity, you will be able to:

* Explain how natural processes involving greenhouse gases cause warming of the Earth’s atmosphere.

**Causal Principles**

1. Gravitational energy, thermal energy and/or chemical **energy** drive all movement and change of matter on Earth.

3. Matter moves and changes to return a system to **equilibrium.**

1. **Temperature** is a measure of the movement of molecules. Higher temperature means molecules are moving faster.

**PART 1: Background Notes**

**Class Notes**

Complete Table A as we are discussing it in class. What parts of a greenhouse correspond to the greenhouse effect?

|  |  |
| --- | --- |
| Table A. Comparing a Greenhouse and the Greenhouse Effect | |
| **Greenhouse** | **Greenhouse Effect** |
| Glass |  |
| Soil, plants, other surfaces in greenhouse |  |
| Solar radiation |  |
| Heat inside greenhouse |  |
| Reflection of visible light off the glass |  |
| Vents in the greenhouse |  |

**Part 2. Group Work**

1. In Table B, fill in the corresponding features for the greenhouse that match with the greenhouse effect.

|  |  |  |
| --- | --- | --- |
| Table B. Comparing a greenhouse and the greenhouse effect | | |
| **Greenhouse** | **Greenhouse Effect** | **Principle** |
| Glass |  |  |
| Soil, plants, other surfaces in greenhouse |  |  |
| Solar radiation |  |  |
| Heat inside greenhouse |  |  |
| Reflection of visible light off the glass |  |  |
| Vents in the greenhouse |  |  |

2. In Table C, describe how a greenhouse and the greenhouse effect are different.

|  |  |  |
| --- | --- | --- |
| Table C. Differences between a greenhouse and the greenhouse effect. | | |
| **Greenhouse** | **Difference** | **Greenhouse Effect** |
| Glass |  | Greenhouse Gases |

3. How would you redesign a greenhouse to make the process by which air in a greenhouse warms a better analog for the process that warms Earth’s atmosphere? Draw a diagram to illustrate this new design.

4. Imagine that climate changes significantly, and Earth’s atmosphere fills with clouds. How might this impact Earth’s atmospheric temperature?

**Part 3: Homework**

If you complete the group work, you may work on the homework **on your own.** This means your answers should be generally unique from other students’ answers. **Submit your homework using ANGEL**.

1. Where would the heat radiated by the Earth go if greenhouse gases did not exist?
2. What would happen to the temperature of the atmosphere if you were to increase the amount of greenhouse gas in the atmosphere?
3. Imagine you were having a conversation with someone who said the greenhouse effect is the cause of global warming. Write a response to this statement that is scientifically correct based on what you have learned in this class and activity.